We claim:

1. A microelectronic structure, comprising:

a base substrate;

at least one barrier layer provided over said base substrate; and

an adhesion layer disposed between said base substrate and said at least one barrier layer, said adhesion layer containing at least one material selected from the group consisting of titanium, zirconium, hafnium, cerium, tantalum, vanadium, chromium, niobium, tantalum nitride, titanium nitride, tantalum silicide nitride and tungsten silicide.

2. The microelectronic structure according to claim 1, wherein:

said base substrate is at least partly composed of an insulating material and is formed with at least one opening;

said at least one opening completely penetrates said insulating material;

at least one conductive material fills said at least one opening; and

said adhesion layer is disposed directly on said at least one conductive material.

3. The microelectronic structure according to claim 2, wherein said adhesion layer is additionally disposed directly on said insulating material.

4. The microelectronic structure according to claim 2, wherein said insulating material is composed of one of silicon nitride and silicon oxide.

5. The microelectronic structure according to claim 1, wherein said at least one barrier layer includes an oxygen-containing iridium layer.

6. The microelectronic structure according to claim 5, wherein said oxygen-containing iridium layer is a sputtered layer produced at a temperature of at least 250°C in an atmosphere containing by volume between 2.5% and 15% of oxygen.

7. The microelectronic structure according to claim 1, wherein said at least one barrier layer includes an oxygen barrier layer.

8. The microelectronic structure according to claim 7, wherein said oxygen barrier layer is composed of a conductive metal oxide.

9. The microelectronic structure according to claim 8, wherein said conductive metal oxide is composed of one of iridium dioxide and ruthenium dioxide.

10. The microelectronic structure according to claim 1, wherein:

said at least one barrier layer includes an oxygen barrier layer; and

a metal-containing electrode layer covers said oxygen barrier layer.

11. The microelectronic structure according to claim 2, wherein said adhesion layer is disposed directly on said at least one opening in said base substrate and is disposed partly on said insulating material.

12. The microelectronic structure according to claim 11, wherein:

said at least one conductive material disposed in said at least one opening has a region contacting said adhesion layer; and

said at least one conductive material is composed of at least one metal silicide at least in said region contacting said adhesion layer.

13. The microelectronic structure according to claim 1, including a metal silicide layer disposed on said base substrate and directly between said adhesion layer and said opening.

14. The microelectronic structure according to claim 12, wherein said at least one metal silicide contains at least one silicide selected from the group consisting of yttrium silicide, titanium silicide, zirconium silicide, hafnium silicide, vanadium silicide, niobium silicide, tantalum silicide, chromium silicide, molybdenum silicide, tungsten silicide, iron silicide, cobalt silicide, nickel silicide, palladium silicide, platinum silicide and copper silicide.

15. The microelectronic structure according to claim 10, including a metal-oxide-containing layer covering said metal-containing electrode layer, said metal-oxide-containing layer being a layer selected from the group consisting of a

dielectric metal-oxide-containing layer, a ferroelectric metal-oxide-containing layer and a paraelectric metal-oxide-containing layer.

16. A microelectronic structure, comprising:

a base substrate at least partly composed of an insulating material and formed with an opening;

said opening completely penetrating through said insulating material;

at least one conductive material filling said opening and terminating flush with said insulating material;

a barrier layer disposed on said base substrate, said barrier layer including an iridium dioxide layer and an oxygen-containing iridium layer;

said oxygen-containing iridium layer being a sputtered layer produceable at a temperature of at least 250°C in an atmosphere containing by volume between 2.5% and 15% of oxygen;

an adhesion layer disposed over said opening and directly between said base substrate and said barrier layer, said

adhesion layer containing at least one material selected from the group consisting of titanium, zirconium, hafnium, cerium, tantalum, vanadium, chromium, niobium, tantalum nitride, titanium nitride, tantalum silicide nitride and tungsten silicide; and

a noble metal layer disposed on said barrier layer.

17. A microelectronic structure, comprising:

a base substrate at least partly composed of an insulating material and formed with an opening;

said opening completely penetrating through said insulating material;

at least one conductive material filling said opening and terminating flush with said insulating material;

a metal silicide layer disposed over said opening and directly on said base substrate;

a barrier layer disposed above said metal silicide layer, said barrier layer including an iridium dioxide layer and an oxygen-containing iridium layer;

said oxygen-containing iridium layer being a sputtered layer produceable at a temperature of at least 250°C in an atmosphere containing by volume between 2.5% and 15% of oxygen;

an adhesion layer disposed directly between said metal silicide layer and said barrier layer, said adhesion layer containing at least one material selected from the group consisting of titanium, zirconium, hafnium, cerium, tantalum, vanadium, chromium, niobium, tantalum nitride, titanium nitride, tantalum silicide nitride and tungsten silicide; and

a noble metal layer disposed on said barrier layer.

18. A method of fabricating a microelectronic structure, the method which comprises:

providing a base substrate;

applying an adhesion layer on the base substrate, the adhesion layer containing at least one material selected from the group consisting of titanium, zirconium, hafnium, cerium, tantalum, vanadium, chromium, niobium, tantalum nitride, titanium nitride, tantalum silicide nitride and tungsten silicide; and

applying at least one barrier layer on the adhesion layer.

19. The method according to claim 18, which comprises applying the adhesion layer by using a sputtering process.

20. The method according to claim 18, which comprises applying the adhesion layer by using a chemical vapor deposition process.

21. The method according to claim 18, wherein the step of applying the at least one barrier layer includes applying an oxygen-containing iridium layer with a sputtering process in an oxygen-containing atmosphere at a temperature of at least 250°C and a proportion by volume of oxygen in the atmosphere being between 2.5% and 15%.

22. The method according to claim 18, wherein the step of applying the at least one barrier layer includes:

applying an oxygen-containing iridium layer with a sputtering process in an oxygen-containing atmosphere at a temperature of at least 250°C and a proportion by volume of oxygen in the atmosphere being between 2.5% and 15%; and

applying an iridium dioxide layer on the oxygen-containing iridium layer.

23. The method according to claim 18, which comprises:

applying a metal-containing electrode layer on the barrier layer; and

applying a metal-oxide-containing layer on the metal-containing electrode layer, the metal-oxide-containing layer being a layer selected from the group consisting of a dielectric layer, a ferroelectric layer and a paraelectric layer.